

Discussion

History of this Filing

A history of this filing was included in the Response dated October 6, 2006 and filed October 9, 2006 in which the applicants, amongst other submissions, requested that the final status of the last Office Action be withdrawn. This was followed on November 9 by a petition for a one-month extension of time and a 2nd RCE. The legitimacy of the RCE was questioned by the office on November 27, 2006 as having been filed without a request to review the Response of October 6, 2006, but subsequently the Office acknowledged that such a request had been made and the Office Action was entered on June 14, 2007. The Examiner issued a new Office Action dated June 26, 2007. This Response addresses the Office Action of June 26, 2007.

On December 4, 2007 Ralph Dowell of Dowell & Dowell in Arlington, Virginia called the Examiner on behalf of the applicants and ask for an appointment for a meeting-interview at the patent office in the near future. The Examiner declined to allow such an interview representing that he had already spoken by telephone to Terry Sutherland, one of the inventors, and with the applicants' Canadian patent attorney on several occasions. The applicants regret not having an opportunity to have Terry Sutherland attend with Ralph Dowell personally for a meeting with the Examiner where samples of the applicants' products were to have been presented. At the conclusion of this document, the applicants have requested again that such a personal interview be permitted.

The applicants apologize for the length of this Response. This is an important invention for their business and considerable thought has been given to addressing all of the Examiner's earlier objections and to the structure of the Claims as now pending.

Current Amendments

In the Claims

The word "broadened" used in referring to the sweetspot has been changed throughout the claims under examination, substituting "enlarged" as it is this latter word which was used in the specification as originally filed.

Claims 37, 38, 39, and 53 have all been amended to insert in each of these claims as follows:

"d) two lateral regions commencing immediately adjacent to and extending respectively on each either side of the mid-section towards the distal and proximal ends respectively,"

This amendment clarifies that it has always been intended that there be two lateral regions, one on each of the sides of the mid-section and that such lateral regions commence at the edges of the mid-section.

Claim 40 has been canceled and replaced by Claim 72 which is in dependent form, referring back to claim 53. As amended, claim 72 refers to an increase of thickness in the mid-section of at least 8 1/3 percent. The Examiner has objected that such limitation constitutes new matter. However, the applicant wishes to include this claim in the application on the possibility that there

may be an appeal in the event that the Examiner does not change his mind. The legitimacy of this claim is discussed further below.

Claims 42, 43, and 44 as well as Claims 64, 65 and 66 have been given the "floor" in respect of the length ratio of 12 1/2 %, as suggested by the Examiner. This has not been done in respect of Claims 41 and 63 because the original application as filed included the limitation in original Claim 4: " wherein said stiffener has a length less than 50% of the said barrel portion length.." without any such floor.

Claims 45 and 54 have also all been amended to insert in each of these claims that the radial stiffness in the mid-section of the barrel wall is not only greater than that within the two lateral regions of the barrel portion but that bats so constructed are also characterized by the feature that the:

"radial stiffness of the barrel wall in the mid-section provides the bat with a relatively flattened batting performance level along such mid-section compared to the batting performance level along the immediately adjacent portions of the lateral regions on the respective sides of the mid-section."

Support for this limitation is found in the original application as filed in paragraph [0019] under the Summary of the Invention which provides that the invention is achieved:

"[0019].....by precisely stiffening only the peak performance area (generally the sweetspot area) of the existing bat to the performance level of the barrel portion areas immediately adjacent on both sides of the sweetspot of the unstiffened bat."

The language of this characterizing feature introduced into the claims has now also been added to paragraph [0019] by amendment. The above language of claims 45 and 54 is similar in principle to the original text of paragraph [0019] but is also supported by Figure 10 of the original application. As discussed subsequently, Figure 10 is legitimately relevant to the species under examination in so far as it reflects the general characteristics of the invention addressed in the Summary of the Invention.

Out of a further abundance of caution paragraph [0019] has been amended to add the following:

"This effect is particularly achieved when the radial stiffness of the barrel wall in the mid-section provides the bat with a batting performance level that is reduced to substantially the batting performance level of the portions of the lateral regions immediately adjacent to each side of the mid-section."

This language is also inferable from the original language of paragraph [0019]. This language is now also reflected in claims 56 and 75.

Claim 53 has been amended by inserting the limitation from Claim 54:

"the barrel wall thickness in the barrel mid-section that contains the sweet spot area is greater than the thickness of the barrel wall in the lateral regions **by at least 5% over the thinnest portion of the barrel wall in the lateral regions."**

This limitation was reflected in Claim 13 of the specification as originally filed.

Claim 53 has been further amended by inserting the limitation from Claim 56:

"wherein the area of greater thickness in the barrel mid-section is formed of the same general material as the underlying barrel wall portion with which it is associated."

This limitation flows from the stipulation already present in Claim 53 that: "the barrel wall of the barrel portion consists essentially of polymer composite material".

With its former limitations no longer being appropriate, Claim 56 has been amended as referenced above to insert the feature that the:

"radial stiffness of the barrel wall in the mid-section provides the bat with a batting performance level that is reduced to substantially the batting performance level of the portions of the lateral regions immediately adjacent to each side of the mid-section."

Claim 62 has been amended to provide that: " the lateral regions start from 1" to up to but not including [[3]] 2" from the center of the mid-section. This limitation specifically distinguishes over the mechanical structure in the Fritzke reference and has been added out of an abundance of caution. It is supported by the text of paragraph [0016] of the original disclosure as filed.

Claim 40 has been canceled but its limitations have now been added by amendment to Claim 72 where it is dependent on Claim 53. All of these claims reference a characteristic of a bat having a thickened mid-section. Support for this feature of claim 72, namely an increase in thickness of at least 8 1/3% is provided subsequently, below.

The applicant has also inserted a new Claim 73 reading as follows:

"73. (New) A bat as in Claim 55 wherein the thickness of the total barrel wall is greater in the barrel mid-section than in the two lateral regions by an amount selected from the group of ranges consisting of 0.010 inches to 0.040 inches in thickness; 0.015 inches to 0.040 inches in thickness, and 0.015 inches to 0.030 inches."

The Examiner has objected to entry of a supporting paragraph to this effect within the text of the disclosure as being new matter and that ruling is contested subsequently herein. The applicant wishes to have claim 73 present on the prospect that an appeal may occur in the event that the Examiner does not change his mind after reviewing the further discussion below.

The applicant has also inserted a new Claim 74 reading as follows:

"74. (New) A bat as in any one of Claims 53, 54, 55 or 56 wherein the bat is a double-wall bat having an exterior frame with a tubular barrel and an internal tubular insert inserted within the barrel, the insert having a thickened portion extending internally within the insert along the mid-section of the barrel to provide the barrel wall with its barrel wall portion of greater thickness."

This claim reflects the form of bat that the applicant's employer intends to market.

New Claim 75 has already been referenced above.

In the Disclosure

Paragraph [0011] has been amended to correct the reference to Chauvin US Patent Pub. 2002/0094892 by its correct number. An Information Disclosure Statement referencing this document has been filed separately. In this reference, the insert is attached to the outer barrel wall through an adhesive, which feature is not addressed in the claims of this present application. The applicants reserve their rights with respect to subsequent applications.

Paragraphs [0011A] and [0011B] reference the art cited repeatedly by the Examiner in respect of this present application.

In respect of paragraph [0016], an amendment as next set out below was made on June 27 2005. This amendment, the applicants understand, was entered. However, it was incorrectly not shown in our amendment of 6 Oct 06, for which the applicants apologize. The text as amended following the Response to June 27, 2005 read as follows:

[0016] Therefore, in view of the foregoing, what is needed is tubular baseball bats with a specific distribution of variable stiffness along their barrel portions. A main object of the present invention is to provide tubular baseball bats, and particularly existing bats, with changed (usually decreased) bat performance, without significantly increased weight, in order to meet new or changed performance standards. To achieve this, the bats of the present invention are stiffened in the barrel area[,] of peak bat performance commonly referred to as the sweetspot. Typically, this is an area approximately 2" to 4" in width as compared to barrel portion lengths of 4" to 16". One basic feature of the invention is to increase the radial stiffness of the barrel wall in the mid-section region of the barrel portion of the bat over the radial stiffness in the two adjacent regions. This may be done in a variety of manners.
These include:

- by forming the barrel wall of inherently stiffer material within the mid-section,
- by making the barrel wall thicker within the mid-section, or
- by providing a stiffener within the mid-section of the barrel, either on the inside or on the outside barrel wall surface. This is achieved in one variant by inserting or adding to the bat a circumferential stiffener stiffener in the region of the sweetspot. "

The italicized amendments were previously presented as an amendment on October 6, 2006. Paragraph [0016] as set forth in Schedule B hereto assumes that all of these previous amendments have been entered. The text for paragraph [0016] as shown in Schedule B now represents the text for this paragraph in the form as desired by the applicants prior to making this present amendment.

Incorporating the amendments as set out above, paragraph [0016] has now, presently, been amended at its last sentence to add as follows:

"The result is that the barrel wall is radially stiffer in the mid-section of the barrel portion and less stiff radially in the two lateral regions commencing immediately adjacent to and extending respectively on each side of the mid-section towards the distal and proximal ends of the bat respectively."

The additional sentence added to this paragraph is taken from Claim 8 of the specification as originally filed which stated: " wherein said barrel portion is radially stiffer in the middle of the said barrel portion and circumferentially less stiff radially in the two end portions of the said barrel portion."

As previously referenced above, in paragraph [0019] the last sentence has been modified as follows:

"The resultant effect is to provide a relatively flattened batting performance level along/over such mid-section compared to the batting performance level along the immediately adjacent portions of the lateral regions on the respective sides of the mid-section and can approximately double the sweetspot size (that is, the area of the barrel portion which provides maximum bat performance). This effect is particularly achieved when the radial stiffness of the barrel wall in the mid-section provides the bat with a batting performance level that is reduced to substantially the batting performance level of the portions of the lateral regions immediately adjacent to each side of the mid-section."

The explanation for these amendments has been discussed previously in respect to the amended claims. No new matter has been added.

References to "layout density" have been added to paragraphs [0036D] and [0036F]. These paragraphs are associated with the newly presented drawings and refer-back to the type of treatment provided to the mid-section in respect of Figure 6 type embodiments that are being further highlighted by these drawings. Layout density is one of the parameters controlling radial stiffness that can be varied in a polymer composite, as referenced in paragraph [0019] of the original application. Paragraph [0036G] has similarly been amended to clarify that the thickening as depicted in the drawings extends inwardly as depicted in the newly presented drawings and as paralleled by the drawings of the stiffener as originally filed.

Paragraph [0053] has been amended to delete the words "without there being present a boundary". The Examiner objected to these words as representing new matter and the applicant is withdrawing the proposed amendment without agreeing with the Examiner that such language does constitute new matter. The applicant continues to rely in Claim 53 on the feature that in an all-composite barrel provided with a thickened mid-section, the bat as claimed is characterized by:

"the area of greater thickness in the barrel mid-section is formed of the same general material as the underlying barrel wall portion with which it is associated."

In respect of Paragraph [0062], the applicants in the previous Response believed that they were deleting the following concluding sentence from paragraph [0062] that refers to sub-ranges for stiffener thickness:

"Just as the stiffener wall may be typically in the order of .005 inches to .040 inches in thickness, or .010 inches to .040 inches in thickness, or .015 inches to .040 inches in thickness, or 0.015 inches to 0.030 inches, so too the analogous increase in barrel wall thickness along the mid-section may fall within the same ranges."

That previous change was being made without prejudice to the right of the applicant to assert such an amendment in a future application. The applicant wishes to reassert this sentence and has requested its reinsertion in paragraph [0062]. The Examiner has treated this sentence in the Office Action of July 14th, 2007 as if it is still present in the text of the disclosure. The applicants now wish to ensure that this passage is present in paragraph [0062]. Support for this amendment is discussed further below.

Additionally, with respect to Paragraph [0062], the applicant wishes to reassert the limitation that:

"The barrel portion's effective wall thickness in the mid-section can be greater by 5% or 8 1/3% or more over the thickness of the barrel in the lateral, adjacent portions."

This amendment to the disclosure reflects the amendment to claim 72, as discussed above, and is included on the possibility that there may be an appeal in the event that the Examiner does not change his mind. Support for this amendment is discussed further below.

Paragraph [0064], referring to Figure 6, has been amended in respect of the following sentence:

".. This embodiment applies equally well to double-wall and multi-wall (more than two walls) tubular all polymer composite baseball bats and is limited applicable to newly designed polymer composite single wall, double-wall, and multi-walled new bats as opposed to field returned bats...."

It will be apparent that this amendment represents the obvious intent of the original text. The next statement following provides in the same paragraph provides: "... composite thickness can be designed such as to graduate the radial stiffness of the barrel portion 1 along its entire length." The feature of increased thickness is not limited but is "applicable" to newly designed polymer composite baseball bats.

In the Drawings

The applicants have previously intended to present to examiner on both 7 June 06, and again on 6 Oct 06 three sheets of drawings including new Figures 6.1, 6.2 and 6.3. The examiner rejected the first set of drawings filed June 7, 2006 on the basis that they represented new matter. The applicant intended to submit drawings with changes in the Response of October 6, 2006, but apparently the drawings were either not enclosed or were no longer in the USPTO file. The applicant is resubmitting the drawings that they intended to submit on October 6, 2006. The issue of whether these drawings still continue to constitute new matter is discussed further below.

Examiner's Restriction Requirement

The Examiner originally issued a Restriction Requirement in the Office Action of August 4, 2005. The applicant elected with traverse the species of Figure 6 for examination. The applicant understood the species of Figure 6 to be directed generally to polymer composite bats which had been stiffened in the mid-section by a variety of means, including thickening of the mid-section.

The Examiner in his Office Action of June 26, 2007 has observed that he initially understood the species of Figure 6 to be characterized by the opening sentence of paragraph [0064]. That opening sentence begins by referencing: " a single wall tubular polymer composite baseball bat which in accordance with the present invention has a localized area of fiber type and/or angle change 20 resulting in increased radial stiffness generally in the sweet spot area 19 located in proximity to the middle area of the barrel length 1."

However, paragraph [0064] goes on to include the statement:

"Though not shown, the fiber types, and/or fiber angles, and/or fiber sizes, and/or composite thickness can be designed such as to graduate the radial stiffness of the barrel portion 1 along its entire length."

The Examiner in his Office Action of June 26, 2007 has acknowledged that the species of Figure 6 also incorporates these referenced features, and particularly the feature of increased thickness in the mid-section portion. This acknowledgement is appreciated.

The applicant also wishes to draw the Examiner's attention to the fact that the species of Figure 6 extends to embodiments as further described in paragraph [0064] as follows, as now amended:

"Though not shown, this embodiment applies equally well to double-wall and multi-wall (more than two walls) tubular all polymer composite baseball bats and is limited applicable to newly designed polymer composite single wall, double-wall, and multi-walled new bats..."

In the further discussions below, the applicant will draw the Examiner's attention to other portions of the original disclosure which are attributable to the species of Figure 6.

The Examiner previously refused in the Office Action of July 14, 2006 to address claims 53-71 as being based on the embodiments as depicted in Figures 6.1 and 6.3. In the Office Action of June 26, 2007 the Examiner has revised his opinion as to the claims that should be withdrawn and now states that the following claims are withdrawn:

14-30; 33-36; 40; 52; 55; 56; 60/55,56; 61/55,56; 62; 63 /55,56; 64/63/55,56;
65/63/55,56; 66/63/55,56; 67/55,56; 68/55,56; 69/55,56

At this stage in the examination, reserving rights on appeal, the applicants do not contest the withdrawal from examination of Claims 14-30, 33-36, 40 and 52.

The applicant appreciates this initiative by the Examiner in reopening examination, particularly of Claims 53 and 54 and the subsequent dependent Claims 60 - 72 to the extent that they depend on Claims 53 and 54 (rather than withdrawn claims). Amongst these claims, Claim 53 addresses a bat with an all-polymer barrel having a thickened mid-section with lateral sides of reduced radial stiffness to provide an enlarged sweet spot with the additional limitation that the thickness of the total barrel wall is at least 5% greater in the barrel mid-section than in the two lateral regions.

Claim 55 applies where the thickness of the total barrel wall is 0.005 to 0.040 inches greater in the barrel mid-section than in the two lateral regions. The applicant objects to withdrawal of this claim from examination and other claims, as further discussed below.

The applicants traverse the withdrawal from examination of Claims 55, 56 and subsequent claims dependent thereon that are withdrawn by reason of dependency on such claims. In fact, the applicant's request that the Examiner review with an open mind all of the claims as pending from claim 37 onwards so as to avoid removing such claims from examination based upon the restriction requirement.

Effect of the Restriction Requirement

As observed by the applicant in the previous Response, the withdrawal of claims as not finding support in the Figure 6 embodiment has created considerable complications for the applicant in advancing this application. The applicant acknowledges that the species of Figure 6 is under examination pursuant to the earlier Restriction Requirement of the Examiner. However, the Examiner is mistaken in withdrawing from examination those claims that are directed to features of the invention that are not *ipso facto* depicted in the drawing of Figure 6. The applicant did not elect Figure 6; the applicant elected the species of Figure 6. Figure 6 is simply a convenient indicator of the species of the invention that is described further in the disclosure. The species of Figure 6 refers to a polymer composite bat with a variety of special treatments in the barrel portion to achieve an enlarged sweetspot. The applicant submits that the greater part of the disclosure can be attributed to Figure 6.

The applicant previously attached to the Response of October 6, 2006 as Schedule C a shortened version of the original disclosure as filed, selecting portions which had been highlighted as being clearly associated with Figure 6. The applicant makes references to those highlighted portions again. Those highlighted portions are not the only portions that are relevant to Figure 6. But these portions have been highlighted to bring-home to the Examiner that the disclosure must be taken as a whole in appreciating the characteristics that may be assigned to Figure 6.

It is the position of the applicant that, where characteristics are explicitly attributed to one or another variant of the invention in the course of the written disclosure, it would be understood that such characteristics are intended to apply to all other variants of the invention where such characteristics are appropriate or compatible with such other variants. Thus for example paragraph [0017] as filed states:

“[0017] The preferred short light weight polymer composite circumferential stiffener employed adds only minimal weight to a given bat thus allowing the stiffened bat to be continued to be used within the required weight requirements of baseball.... An alternative solution of the

present invention to vary stiffness, and thus bat performance, along the barrel portion is to vary thickness along the barrel portion."

And paragraph [0050] as filed states:

"[0050] The bats of the present invention, shown in Figs. 4, 5, 6, 7 and 8 have similar dimensions to the foregoing prior art bats shown in Figs. 1, 2 and 3."

Further, paragraph [0062] ends by stating:

"Though not shown, an alternative solution (since stiffness is proportional to thickness) to the stiffener 18 is to vary the barrel thickness 6 along the barrel length 1, either full length or any portion of the barrel length 1 in order to vary bat performance."

While this paragraph starts by referring to the thin polymer composite stiffener 18 of the present invention, the "alternative solution" referenced fits exactly with the species of Figure 6. Paragraph [0064] in specifically referencing Figures 6 states:

"... the fiber types, and/or fiber angles, and/or fiber sizes, and/or **composite thickness** can be designed such as to graduate the radial stiffness of the barrel portion 1 along its entire length. That is, the radial stiffness could be highest in the peak performance area (generally the sweetspot area 19) and gradually changing in uniform increments towards the barrel ends where the radial stiffness would be lowest."

This is the language of original paragraph [0064] as filed.

No stronger association between the mechanical characteristics of the stiffener 18 and the thickening of an integral portion of the barrel wall could be inferred. The use of "an alternate solution" in paragraph [0062] shows that the wall thickening is intended to be equivalent to the stiffener. Accordingly, all of the characteristics of the stiffener are attributable to the thickened barrel wall variant of the species of Figure 6.

Following from these examples, it should be taken as a general principle that all of the species of the invention may be associated with the information and data that is attributed to any of the species of the invention unless there is an inconsistency.

Applying this reasonable policy, it is legitimate for the applicant to introduce into the claims and into different parts of the disclosure features of the invention that are expressly attributed to other variants of the invention and which are inferable as being characteristics that are suited to the elected species. This is in contrast to the policy of the Examiner who, relying on the species election, proposes to divide-up the disclosure into watertight compartments, effectively denying the right of the applicant to rely upon characteristics that have been disclosed in the original application. Effectively, if the Examiner were to persist in this policy, he is would be applying a new-matter objection across portions of the written disclosure.

This is not a case where five independent inventions have been described, supported by five separate descriptions that do not relate to each other. All of the five species, Figures 4, 5, 6, 7 and 8 identified by the Examiner relate to baseball bats which are designed to exhibit the characteristic of having an enlarged sweet spot. All of these variants share common characteristics, namely that the mid-section of the barrel is radially stiffer than the lateral two sides. This is the common thread.

It is on this basis that the applicant states that, where characteristics are explicitly attributed to one or another variant of the invention in the course of the written disclosure as being exemplary of the invention, it should be understood that such characteristics are intended to apply to all other variants of the invention where such characteristics are appropriate or compatible with such other variants. The Examiner has acknowledged in the last office action that the species of Figure 6 does refer to polymer composite bats that use varying thickness to control radial stiffness. With this acknowledgment, it is hoped that the Examiner will now accept that other characteristics of the invention disclosed in the specification can be attributed to Figure 6.

Submissions to Support Entry of New Figures 6.1-6.3

The applicant will first deal with the issue of new drawings that have been submitted in the form of new Figures 6.1-6.3.

The Examiner objected in the Office Action of July 14, 2006 to the introduction of new Figures 6.1-6.3 previously tendered as constituting new matter. Those figures all addressed configurations resulting in increased radial stiffness in the sweet spot area of the barrel portion by reason of thickening of the mid-section of the barrel. Amended versions of those figures were intended to accompany the Response of October 6, 2007.

In the Office Action of June 26, 2007 the Examiner observed that substitute Figures 6.1-6.3 said to have been tendered on October 6, 2006 did not accompany the Response, or at least were not present in the Patent Office file. Further copies of such substitute Figures 6.1-6.3 are delivered herewith. It is to be noted that these figures differ from the earlier figures tendered prior to the Office Action of July 14, 2006 only in that the edges of the thickened portions as depicted in the drawings are abrupt and are not tapered. The legitimacy of these figures will now be addressed.

In the Office Action of July 14, 2006 the Examiner stated that: "... there is no original disclosure of a thickened portion shaped as shown in the drawings". And in respect of Figure 6.2 that: "... there is not original disclosure of a tapered inner wall at the junction of the barrel and the bat taper".

In the Office Action of June 26, 2007 the Examiner has reiterated this rejection, saying: "... there is no original disclosure of a thickened portion shaped as shown in the drawings. In Figure 6.2 there is not original disclosure of a tapered inner wall at the junction of the barrel and the bat taper."

Accordingly, the Examiner's objection to Figures 6.1-6.3 would seem to be directed, not to the fact that they depict an integrally thickened portion of the barrel wall, but that they depict a tapered transition zone at the boundaries of the thickening.

The Examiner's concern for the shape of a thickened portion of the barrel wall in the applicants proposed amended drawings is not justified. The original proposed amended Figures

6.1-6.3 simply demonstrate what would naturally be understood by the words provided in paragraphs [0053] and [0064] of the disclosure. The underlined passages from following quotation from paragraphs [0053] and [0064] clearly refer to the concept that:

"[0053] ... with composite materials, which are preferred, properties of bats made in accordance with the present invention, such as radial stiffness which determines bat performance can be controlled (i.e. designed to a given requirement) by altering such parameters as the fiber alignments along the bat length 1, and/or the type of fibers chosen, their dernier or layout density and/or the thickness of the polymer composite structure."

"[0064] ... composite thickness can be designed such as to graduate the radial stiffness of the barrel portion 1 along its entire length. That is the radial stiffness could be highest in the peak performance area (generally the sweetspot area 19) and gradually changing in uniform increments towards the barrel ends."

The expression "graduate the radial stiffness" implies that the barrel wall thickness can progressively increase. Accordingly, the applicant submits that the Examiner should have accepted the original previously presented Figures 6.1-6.3 which showed tapered ends on the thickened portion.

It should be noted that, notwithstanding what was said in previous Responses which are now superseded by this Response, Claim 69 specifically refers to: "the barrel wall thickness on either side of the barrel mid-section that contains the sweet spot area is graduated towards a decreasing thickness within the lateral regions." This feature is apparent from Figure 10 which shows the thickening is occurring in two steps on either side of the center of the barrel. This effect is also described in paragraph [0060] as follows:

"[0060] In Figure 10, in an example of the present invention, the polymer composite stiffener 18 is approximately twice as stiff in the center 2" of the sweet spot area 19 as in the 1" area immediately adjacent to the center area on each side of the center area. The polymer composite stiffener 18 fiber type, fiber angles and thicknesses are designed such as to reduce the bbs from 100 to 96 in the center area 2" of the barrel length 1 and from 98 to 96 bbs in the 1" areas immediately adjacent to the center area."

Nevertheless, out of an abundance of caution, the applicant tenders herewith alternate Figures 6.1-6.3 which show the ends of the thickened portion on a unitary bat, (and the ends of the thickened portion of a possible insert), as terminating in a more abrupt ending than a tapered ending. Such more abrupt ending is akin to the edge of the stiffener 18 as shown in Figures 4, 5, 7 and 8 as originally filed and therefore it is fully disclosed in the present application. The presence of such a disclosure in the original application with respect to the stiffener 18 as shown in Figures 4, 5, 7 and 8 may be used to infer that a thickened portion of a unitary bat of the type of Figure 6 would have a similar shape.

By way of conclusion, the Examiner's attention has already been previously drawn to 37 CFR 1.81 (d) which provides that drawings submitted after the filing date may not be used to supplement the original disclosure for purposes of interpretation of the scope of any claim.

In the previous Responses, presented to examiner on both 7 June 06, and again on 6 Oct 06, the applicant submitted amendments to the description of the figures in order to identify Figures 6-1-6.3. The applicant confirms that it wishes to have such amendments entered and is proceeding on the assumption that such amendments are now entered to the written text of the specification. The Examiner is asked to check to make sure this is true.

Amendments to the Text of the Disclosure

In the Office Action of June 26, 2007 the Examiner objected that several of the amendments to the text of the disclosure tendered and entered pursuant to the Response of October 6, 2006 were objectionable as not being attributable to the species of Figure 6 or constituted new matter. Those specific references will now be discussed. The Examiner also objected to amendments to the disclosure on the basis that they constituted new matter. Those amendments will be reviewed subsequently.

Attribution of characteristics to the species of Figure 6

The applicant previously asserted in an earlier Response that it has the right to retain in the disclosure the following previously amended passage in paragraph [0062]:

"Analogous to Figures 4, 5, 7 and 8 an alternative solution (since stiffness is proportional to thickness) to the stiffener 18 is to vary the barrel thickness 6 to the same extent and manner along any portion of the barrel length 1 of any bat according to the invention, including the bat of Figure 6, in order to vary bat performance."

This passage was introduced in the Response dated December 22, 2005 and the Examiner did not object to this amendment in his Office Action of February 7, 2006. However, the Examiner has now, apparently, in his Office Action of July 14, 2007, objected to the introduction of such language.

As submitted previously, it is the applicant's position that this previously entered amendment falls in the class of a disclosure that was inferable from the original text as filed. Accordingly, the applicant requests reconsideration by the Examiner of his objections to these passages and approval for the retention of the above text as amended in the specification.

Thickness of the barrel mid-section for species of Figure 6

The Examiner states that the original disclosure lacks a basis to attribute to Figure 6 the features of thickness attributed to the thickener 18 of Figure 4, 5, 7 and 8. Thus the Examiner has required the deletion from paragraph [0062], which specifically applies to Figure 6, of the words:

"Just as the stiffener wall may be typically in the order of .005 inches to .040 inches in thickness, or .010 inches to .040 inches in thickness, or .015 inches to .040 inches in thickness, or 0.015 inches to 0.030 inches, so too the analogous increase in barrel wall thickness along the mid-section may fall within the same ranges."

The Examiner has also stated that corresponding Claim 55, which addresses the originally disclosed range of .005 inches to .040 inches, is not directed to the species of Figure 6.

The Examiner has acknowledged that the presence of original Claim 13 provides adequate support to attribute to the species of Figure 6 the feature of Claim 54 as follows: "the thickness of the total barrel wall is at least 5% greater in the barrel mid-section than in the two lateral regions." The Examiner has not, however, made this concession with respect to Claim 55 which is limited as follows: " the thickness of the total barrel wall is 0.005 to 0.040 inches greater in the barrel mid-section than in the two lateral regions."

Paragraph [0062] of the application as filed provides: "The thin polymer composite stiffener 18 of the present invention is typically in the order of .005" to .040" thick." The Examiner has taken the position that this thickness characterization is to be considered to be directed to the stiffener alone. The Examiner has taken this position because:

"...it is the Examiner's opinion that one cannot necessarily read that when using a thickened barrel to achieve an "alternative solution" the exact same thickness used when using the stiffener should also be used. There is certainly no statement to this effect, and there is no discussion of what differences or similarities might occur in the "alternative solution" depending on what thickness of barrel is used. Further, some inherent structural differences would have to be present between an insert which is bonded to a bat, and a bat which is constructed with simply thicker material."

The applicant understands that the Examiner objects to this inserted passage which specifically attributes a series of ranges of thicknesses to the thickened portion of the barrel wall of the species of Figure 6 both as "new matter" and as not attributable to Figure 6. The Examiner refuses to attribute specific thickness parameters to the species of Figure 6 on the basis that it is not inferable from the original disclosure that a thickened mid-section portion of a unitary polymer bat of the type of Figure 6 would be understood by a reader as having a thickening that is akin to the thickening attributable to the addition of a stiffener 18 in the other embodiments.

With respect, the applicant asks the Examiner to reconsider his position, both with respect to the originally disclosed range of .005 inches to .040 inches and with respect to the subranges which are addressed separately below.

The issue with respect to the proposed amendment is whether the inventor had, at the time of filing, possession of the concept being described. This is not a situation where the proposed amendment is to be judged as either having or lacking inventive character over the balance of the disclosure. This is not a case where the applicants are adding a new concept to the disclosure. The concept under review is already present in the disclosure.

The standards for rejection of amendments directed to "new matter" not previously mentioned in the specification do not apply to the originally disclosed range of .005 inches to .040 inches. The difference of opinion between the applicant and the Examiner seems to be whether the characteristics specifically described with respect to one embodiment can be attributed to another embodiment which the inventor says will perform equivalently.

In fact, all of the embodiments of the invention have been put forward in the original specification on the basis that they will perform equivalently. All of the embodiments are directed to providing increased radial stiffness within the sweet spot zone of a tubular baseball bat with the beneficial result of extending the length of the sweet spot i.e. "enlarging or broadening the sweet spot". This is a strong reason for concluding that the characteristics specifically described with

respect to one embodiment can be attributed to another embodiment. As long as it can be said that the applicant had possession of the knowledge of a feature with respect to one embodiment, the applicant should be entitled to amend to attribute that feature to another embodiment.

In this respect, the Examiner's attention is drawn to the underlined portion of the following paragraph of the Manual of Patenting and Examination Procedure:

2163.06 Relationship of Written Description Requirement to New Matter

Lack of written description is an issue that generally arises with respect to the subject matter of a claim. If an applicant amends or attempts to amend the abstract, specification or drawings of an application, an issue of new matter will arise if the content of the amendment is not described in the application as filed. Stated another way, information contained in any one of the specification, claims or drawings of the application as filed may be added to any other part of the application without introducing new matter.

Reconsideration is accordingly requested so as to permit the retention in Paragraph [0062] of at least the following passage:

"Just as the stiffener wall may be typically in the order of .005 inches to .040 inches in thickness, so too the analogous increase in barrel wall thickness along the mid-section may fall within the same ranges."

The additional language respecting the subranges will be addressed further below.

Use of fiber "layout density" to control barrel wall stiffness

The Examiner has objected to the proposed amendment to paragraph [0064] to attribute "layout density" as a feature to support the characterization of the species of Figure 6. This is not an objection arising out of an amendment made by the applicant's last Response. This is an objection made in respect of an amendment made in the earlier Response of December 22, 2005 (filed December 23, 2005) which the Examiner did not note as being objectionable in his Office Action of February 7, 2006.

The Examiner acknowledges in the present Office Action that the term "layout density" is adequately supported in the original disclosure. In doing so, presumably the Examiner is referring to the following passage at paragraph [0053]:

"[0053] ...radial stiffness which determines bat performance can be controlled (i.e. designed to a given requirement) by altering such parameters as the fiber alignments along the bat length *l*, and/or the type of fibers chosen, their *dernier* or layout density and/or the thickness of the polymer composite structure."

The Examiner accordingly acknowledges that the reference to "layout density" was in the original specification as filed, presumably assumed by the Examiner to be limited to the stiffener 18. On this basis the Examiner has objected that the applicant cannot amend paragraph [0064], which clearly addresses Figure 6, to refer to "layout density", or base claims on this feature while only the embodiment of Figure 6 is under examination, because, according to the Examiner, this feature of varying "layout density" is not attributable to the Figure 6 embodiment.

The Examiner has previously acknowledged that the first sentence of paragraph [0064] clearly refers to the species of Figure 6, namely a: "polymer composite baseball bat which in accordance with the present invention has a localized area of fiber type and/or angle change 20 resulting in increased radial stiffness generally in the sweet spot area." But paragraph [0053] also specifically refers to controlling the radial stiffness of a body as follows:

"[0053] However, with composite materials, which are preferred, properties of bats made in accordance with the present invention, such as radial stiffness which determines bat performance can be controlled (i.e. designed to a given requirement) by altering such parameters as the fiber alignments along the bat length 1, and/or the type of fibers chosen, their dernier or layout density and/or the thickness of the polymer composite structure."

Clearly these are associated passages. The parallels are obvious. Both passages refer to controlling radial stiffness in the barrel wall. This is the central, unifying concept of the invention. Both passages refer to the use of polymer composite materials. Both passages make reference to controlling fiber type and fiber alignment, which is the same as fiber angle. Accordingly, it is submitted that the feature of varying "layout density" of fibers in a polymer composite bat can properly be attributed to the embodiment of Figure 6.

Accordingly, the Examiner's request that the reference to "layout density" in paragraph [0064] be removed on the basis that it represents new matter is not appropriate. Reconsideration is therefore requested.

New Matter Rejections

Thickness Subranges

The Examiner has also objected to the following insertion into Paragraph [0062], now addressed in Claim 73 as being new matter:

"...the group consisting of .010 inches to .040 inches in thickness, .015 inches to .040 inches in thickness, and 0.015 inches to 0.030 inches,"

The applicant submits that such sub-ranges do not constitute new matter on the basis of *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976) and MPEP 2163.05 Changes to the Scope of Claims, III - Range Limitations, as discussed in the applicants' earlier Responses, the contents of which are adopted herein by reference. The Examiner is particularly requested to review MPEP 2163.05.

On this basis, the applicant has added new Claim 73 directed to such subranges. The applicants request the Examiner to approve the amendments directed to the thickness subranges.

Proportionate Length of the stiffened mid-section barrel portion

The applicant appreciates the Examiner's ruling that the species of Figure 6 permits examination of claims directed to a stiffened mid-section sweet spot length representing something less than 100% of the barrel length for various ratios down to, but not less than, 12.5% of the barrel

length. However, the applicant wishes to contest his opinion that that applicants' specific claims 41 and 63 directed to a length of less than 50% are not supported in the original disclosure.

The Examiner has rejected under 35 USC 112 Claims 41-45, 63-66 and 72 on the basis that such claims are directed to subject matter not described in the original specification in a way that shows that the applicant inventors had possession of the so-claimed invention at the time of filing. All of those claims were directed to specifying maximum values for the ratios between the length of the stiffened barrel mid-section portion and the total length of the barrel. The applicant has inserted a lower limit on this ratio in respect of Claims 42-45 and 64-66. Claim 72 has been canceled

In response and in defense of Claims 41 and 63 not requiring the lower limit, the applicant wishes to refer the Examiner to the following portions of the original disclosure:

Paragraph [0055] refers to a composite stiffener 18: "located internally within the barrel portion 9 generally in the sweet spot area 19 located in proximity to the middle area of the barrel length"

Paragraph [0056] characterizes the sweet spot as the: "area 19 located around the middle of the barrel length".

Paragraph [0063] states: "Though not shown, an alternative solution (since stiffness is proportional to thickness) to the stiffener 18 is to vary the barrel thickness 6 along the barrel length 1, either full length or any portion of the barrel length 1 in order to vary bat performance."

And Claim 4 as originally filed stipulated for: "A bat according to claim 2 wherein said stiffener has a length less than 50% of the said barrel portion length and adds less than 2 oz. to said bat weight."

All of the above passages admit to the possibility that the ratio of the mid-section to total barrel length is less than 12.5%. Both "any portion of the barrel length" and "less than 50% of the said barrel portion length" are open-ended as to a lower limit.

Accordingly, the applicant requests the Examiner to withdraw the rejection of claims 42-45, and 63-66 as amended based on 35 USC 112.

Width of the modified barrel mid-section

The Examiner has stated that the width features attributable to the stiffener cannot be attributed to radially stiffened mid-section portion of the species of Figure 6 in respect of Claim 62. Claim 62 now reads as follows:

"62. (Currently amended) A bat as in any one of Claims 37, 38, 39, 53, 54, 55 or 56 wherein the lateral regions start from 1" to up to but not including [[3]] 2" from the center of the mid-section and extend towards the proximal and distal barrel ends."

The amendment: from 1" to up to but not including [[3]] 2" has been made to conform to the dimensions provided in Figure 10 and is also inferable from paragraph [0016] under the "Summary

of the Invention". The applicants have separately made submissions as to the legitimacy of attributing the features relating to the stiffener 18 to the thickened barrel feature of Figure 6.

In respect of Claim 62 it is acknowledged that there is no express statement in the original disclosure as to the lateral regions in respect of the species of Figure 6 starting at 1" to 2" from the center of the mid-section and extending towards the proximal and distal barrel ends. However, as discussed above, the applicant submits that all features attributable to the stiffener in the original disclosure can be attributed to a thickening in the mid-section portion of the barrel of a bat of the species of Figure 6.

And furthermore, the stiffener and the width of the stiffened portion of the barrel have been specifically identified as being from 2 to 4 inches in dimension under the Summary of the Invention:

"[0016] ...the bats of the present invention are stiffened in the barrel area of peak bat performance commonly referred to as the sweetspot. Typically, this is an area approximately 2" to 4" in width in respect to the width of the sweet spot."

This not only provides the dimensions of Claim 62 but also complements and links the depiction in Figure 10 of a two-level stiffener, having a central portion of greater thickness that is 2 inches wide, bounded on each of the two sides by an additional lower level extension of stiffener of 1 inch on each side, for a total width of 4 inches at the lower-level.

Accordingly, the applicants request the Examiner to reconsider the rejection of Claim 62 and to allow Claim 62 as amended to advance to grant.

Thickness differential of 8 1/3 % for the barrel mid-section

Claim 40, now canceled, has been replaced by claim 72, stipulating and for a minimal thickness differential in the barrel at the mid-section of 8 1/3 % over the lateral regions. The Examiner has previously stated that there is no support in the original disclosure for such feature.

The applicants have derived this thickness differential from the original data in the original disclosure by calculation using data from the applicants' original disclosure, as set out in the earlier Response dated December 22, 2005 (filed December 23, 2005), page 5, which is adopted by reference herein.

It is clear from the original specification as filed that a range of thickness differentials are possible. Values for these ranges may be established by combining the explicit thickness range of .005 inches to .040 inches from paragraph [0062] with the range of barrel wall thickness is of paragraph [0048], namely .100 inches to .140 inches for aluminum bats, and up to .220 inches for all composite bats. The value of 5% is apparent by dividing a thickness value of .005 inches by a barrel wall thickness of .100 inches. The value of 8 1/3 % is easily obtained by taking an intermediate value within the first range and dividing it by an intermediate value within the second range. Therefore this parameter is deriveable from the data as originally contained in the specification filed by the applicants. On this basis, its inclusion by amendment should not be rejected as new matter.

Reconsideration is accordingly requested.

Unitary character of a thickened polymer bat

In respect of paragraph [0053] and presumably Claim 56 based thereon the Examiner has objected to the following entire phrase as constituting new matter:

"Such thickened polymer composite material is integrally formed with the barrel wall portion whereby the thickened portion is formed of the same polymeric material as the underlying barrel wall portion without there being present a boundary therebetween."

This amendment to the disclosure has been presented in order to give meaning to the expression in Claim 56 in respect of the stipulation that: "the thickened portion is formed of the same material as the underlying barrel wall portion without there being present a boundary therebetween."

This rejection has been made on the basis that, as stated by the Examiner: "... forming the thickening portion such that no boundary is present between the layers ... would not be an inherent feature because to thicken the barrel wall some extra layer of fiber composite materials could have been used which would necessarily have a boundary between itself and the underlying wall portion."

Accordingly, Claim 56 has been deleted and claim 53 amended to include the following limitation as follows:

"53. (Currently amended) wherein the area of greater thickness in the barrel mid-section is formed of the same general material as the underlying barrel wall portion with which it is associated."

This feature inherently arises from the fact that claim 53 addresses a bat: " wherein the barrel wall of the barrel portion consists essentially of polymer composite material".

And paragraph [0053] has been amended to read as follows:

"Such thickened polymer composite material is integrally formed with the barrel wall portion with which it is associated whereby the thickened portion is formed of the same polymeric material as the underlying barrel wall portion without there being present a boundary therebetween."

This amendment is consistent with the species of the Figure 6 embodiment being based upon the use of polymer composite material and is readily inferable from the known nature of polymer composite material. The objected-to reference to the absence of a boundary has been deleted without acknowledging that the Examiner is correct in saying that there is no support for such a feature.

Accordingly, the Examiner is requested to reconsider the requested amendment to paragraph [0053] and the former withdrawn status of Claim 56 based thereon as this limitation is now part of claim 53.

Conclusion Respecting Amendments to the Text of the Disclosure

The applicants believe they have addressed all of the issues of the Examiner relating to amendments to the text of the disclosure. Otherwise, the applicant traverses the Examiner's refusals to accept such amendments and requests reconsideration of such refusals.

Issues of Patentability

Patentable character of Claims 37, 38, 39 and 53

In addressing the patentability of all the claims based on the prior art, the applicant will first observe on the scope of Claims 37, 38, 39 and 53.

All of Claims 37, 38, 39 and 53 are characterized by a bat barrel whose constituent material is characterized as follows: "consists essentially of polymer composite material". All of these claims are directed to bats wherein the barrel wall is provided: "with a radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel portion and thereby with a broadened an enlarged sweet spot

The scheme of Claims 37, 38 and 39 is that these claims are all generally similar, being distinguished as follows:

"37. ...polymer composite material containing reinforcing fibers at various angles with respect to the longitudinal axis, the reinforcing fibers present within the barrel wall of the mid-section being at a higher average angle with respect to the longitudinal axis than the average angle of the fibers within the barrel wall of the two lateral regions of the barrel portion."

"38 ...polymer composite material which contains reinforcing fibers and the barrel wall in the mid-section contains a higher percentage of fibers than in the lateral regions."

"39 ...the polymer composite material contains reinforcing fibers of types having differing stiffnesses, and the reinforcing fibers within the barrel wall of the mid-section contain a higher percentage of fibers of higher stiffness than in the lateral regions."

"53 ...the barrel wall thickness in the barrel mid-section that contains the sweet spot area is greater than the thickness of the barrel wall in the lateral regions by at least 5% over the thinnest portion of the barrel wall in the lateral regions, ... and ...the barrel wall of the barrel portion consists essentially of polymer composite material."

All of these claims are directed: "to provide the barrel wall with a radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel portionand thereby with a broadened an enlarged sweet spot." Accordingly, all of these claims sure the common theme which is exemplified by the species of Figure 6.

Claims 45 and 54 add as a further functional qualification that the special treatment to the mid-section is intended to establish:

a relatively flattened batting performance level along such mid-section compared to the batting performance level along the immediately adjacent portions of the lateral regions on the respective sides of the mid-section and thereby with a broadened an enlarged sweet spot."

This is a further characterization of the consequence of providing an enlarged sweet spot. Bats according to the invention manifest a reduced batting performance along the mid-section of the barrel as a consequence of modifying the radial stiffness of the barrel wall.

Patentability rejections based on novelty and obviousness

The Examiner has applied 35 USC 102 based upon Vacek (US Publication No. 2004/0209716) against Claims 38, 53, 60/53, 61/53, 67/38, 67/53, 68/38, 68/53.

The Examiner has applied 35 USC 103 based upon Vacek in light of Fritzke (US Publication No. 2004/0157689) against Claims 42/(37, 38, 39); 43/42/(37, 38, 39); 44/42/(37, 38, 39); 45/42/(37, 38, 39); 63/(53, 54); 64/63/(53, 54); 65/63/(53, 54); 66/63/(53, 54); and 72/60/(53, 54).

Barrel wall to include, or not, the end cap

In the previous Response, the contents of which are adopted herein, the applicants therein elaborated why the expression "barrel portion" is used to indicate the portion of a bat which is intended for striking the ball. The insert in Vacek extends to the end cap, and leaves no lateral region of the barrel portion on the distal side of the mid-section of Vacek's barrel to have a lesser radial stiffness. Therefore the applicant endeavoured to argue that Vacek does not have a barrel portion with two lateral sides of reduced radial stiffness.

Furthermore, and in this regard, the applicant observed that the distal end of a baseball bat is not intended for striking a ball; and when such ends are closed by an end cap, the portion of the bat that engages with an end cap does not qualify as the barrel portion intended for striking the ball. This may have been an unfortunate linguistic exercise.

In his Office Action, the Examiner has taken the position in response to these submissions (page 8) that: "the portion of the barrel into which the end cap is inserted is capable of striking the ball, (and often does so) and therefore what is intended of this portion of the barrel is not relevant." The Examiner seems to be insisting that the barrel wall in Vacek extends over and includes the end cap.

The real issue is that all of the independent claims under examination include the limitation that the barrel wall is to be provided with: "a radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel portion" and thereby with an enlarged sweet spot. The prior exchange over the definition of what constitutes the barrel wall was intended to show that Vacek lacks a lateral region at the distal end of the bat wherein the radial stiffness is less than the radial stiffness in the mid-section of the barrel.

This point will now be reiterated from another aspect.

Vacek lacks a lateral region at the distal, cap end

If the Examiner insists that the barrel portion of a bat extends past and includes the end cap, then the Examiner must acknowledge that the radial stiffness taken through the end cap must be much higher than the radial stiffness taken through hollow portions of the barrel, by virtue of having an additional, stiffening end cap "plug".

The present invention requires that there be lateral regions having lesser radial stiffness than the radial stiffness of the mid-section of the barrel. This reference to "two lateral regions" refers to both sides of the mid-section. This has always been a limitation for all of the above independent claims. The clarifying amendment made in this present Response does not change what was always intended.

Furthermore, and as stated above, there is no teaching in Vacek of providing two lateral regions of sufficient dimensions in order to meet the objective of providing an enlarged sweet spot, since it is clear that the radial stiffness in the barrel of the Vacek patent, as measured through progressive segments taken along the barrel length, does not decrease proceeding towards the distal end. On this basis it cannot be said that Vacek has two lateral regions as defined by the independent claims of this pending application.

Examiner's interpretation of Vacek insert

In making his present rejection, the Examiner has stated (page 6), as also recited in the earlier Office Action (page 5), as follows:

"Vacek's insert 112 provided in the center of the barrel contains layers of fibers and thus this portion of the bat barrel has a greater percentage of fibers than do the portions of the barrel at either end of the bat insert".

The Examiner's statement in the quotation above completely ignores whether the Vacek bat includes within the barrel length two lateral regions of reduced radial thickness. As has been shown, there is no provision at the distal or cap end of Vacek's barrel that could qualify as a lateral region of this character. Clearly at the cap end, Vacek's barrel lacks a lateral region on the distal end of the barrel that has the requisite lesser value for radial stiffness as defined by the independent claims of the pending application.

The presence of lateral regions is important. Such lateral regions provide elasticity to the bat barrel, improving bat performance. The present invention proposes to degrade bat performance partially by introducing increased radial stiffness in the mid-section of the barrel. In bats according to the invention there will be less overall trampoline effect by reason of the special treatment of the mid-section of the barrel. The present invention also aspires to provide adequate bat performance due to the presence of lateral regions which have a lesser radial stiffness and therefore enough elasticity and compliance to sustain bat performance. Such lateral regions complement the degraded performance achieved by stiffening of the mid-section of the barrel. And this is not taught in Vacek.

Vacek does not address an enlarged sweet spot

In making the present rejection, the Examiner has stated (page 6) as follows:

"Vacek specifically points out.... that [the insert] enhances the hitting zone of the bat by increasing the trampoline effect. This is considered an increased or broadened sweet spot."

But in fact, the reference to "hitting zone" in Vacek occurs in the following context:

"[0045] Since the sleeve 112 is made of a composite, the sleeve also provides a trampolining effect in addition to the trampolining effect of the tubular hitting surface 110 of the bat 100. The sleeve 112 is formed of a composite which is more stiff than the composite forming the tubular hitting surface 110 of the bat 100. Like the tubular hitting surface 110, the deformation of the sleeve 112 conforms to the contact area of the ball. The deformation of the sleeve 112 results in radial or hoop deformation where the sleeve 112 temporarily deforms into an oval, when viewed in cross section. Deformation of the sleeve 112 provides an additional springboard or trampoline effect which is in addition to the springboard or trampoline effect associated with the tubular hitting surface 110 of the bat 100. The trampolining effect of the sleeve 112 further enhances the hitting zone of the bat 100 and provides additional velocity to the ball when hit by the bat 100. The trampoline effect provides distance to a particular hit."

The Examiner appears to be relying on the reference to "enhances the hitting zone" in the second-to-last line of this paragraph. The last two lines of this paragraph are a repeat of the last two lines of paragraph [0042] which reads as follows:

"[0040] ... When a ball impacts the bat 100 during the batter's swing, the bat undergoes a localized deformation conforming to the contact area of the ball, as well as radial or hoop deformation (i.e., the cylindrical bat temporarily deforms into an oval when viewed in cross section). This deformation provides a springboard or trampoline effect which further enhances the hitting zone of the bat 100 and provides maximum velocity to the ball when hit by the bat. The trampoline effect provides distance to a particular hit."

It should be noted that it is the deformation of the bat to provide a springboard or trampoline effect which "further enhances the hitting zone of the bat". This is not language which suggests that an enlarged sweet spot has been achieved. This is the language of batting performance in terms of range. Vacek is endeavouring to improve the bat performance rather than to reduce bat performance along a special portion of the barrel.

The Examiner apparently is interpreting "enhances the hitting zone" as an indication that Vacek has achieved a broadening of the sweet spot and is communicating this fact to the reader. The applicant submits that the Examiner is in error in this interpretation.

The expression, "the hitting zone" may refer to the zone or area in a field into which a ball is being hit. Or it may simply refer to the portion of the barrel which is used for hitting a ball. It remains to be seen which definition is more accurate.

If it is assumed that Vacek means the first definition of "hitting zone"; i.e., that the phrase refers to the zone or area in a field into which a ball is being hit, then it is this zone or area that is

larger upon use of Vacek's invention. This arises through improved batting performance and not by means of the presence of a broader sweet spot. Alternately, if it is assumed that "the hitting zone" refers to a portion of the bat barrel, then Vacek is still teaching that he is enhancing the hitting zone in terms of providing improved bat performance i.e. causing the ball to travel further. Again, there is no teaching of broadening or otherwise enlargening the sweet spot.

Furthermore, in both cases where the phrase "enhances the hitting zone" occurs, the next sentence is: "The trampoline effect provides distance to a particular hit". This follow-on sentence is consistent with the interpretation that the "hitting zone", in both cases where the phrase occurs, is enhanced in terms of its ability to improve the distance that a ball will travel once struck. Thus Vacek speaks in terms of enhancing the hitting power of his bat in terms of range. In fact, this is the whole concept upon which Vacek focuses.

Accordingly, it is wrong to interpret "enhances the hitting zone" as an indication that Vacek has achieved a broadening of the sweet spot. There is no teaching to this effect, and there is no structural mechanism described in Vacek's design that would achieve such an effect. Vacek has not taught that the region of maximum performance along the barrel is wider because of a special feature of his bat. Vacek never distinguishes or speaks of a region of maximum performance along the length of the barrel of his bat.

In fact, there is no suggestion in the Vacek disclosure that Vacek is addressing or even is aware of the potential for broadening the sweet spot in an all-composite baseball bat. Rather, the Vacek disclosure is replete with discussions about providing a robust all-composite bat that will resist being dented and will still provide performance in terms of the distance the ball will travel when struck. His repeated references to enhancing the trampoline effect focus on this result. The present invention, by way of contrast, relies upon degrading bat performance in terms of distance of the hit in favour of providing a broader sweet spot. A comparison of Figure 9 and Figure 10 shows this degradation. The present invention contemplates decreasing the trampoline effect in the mid-section of the barrel in order to achieve the result of a broader sweet spot.

Trampoline effect

Reiterating this point, the present application addresses a bat wherein the batting performance is diminished from what might otherwise exist absent the special treatment of the invention. The treatment given by the present invention to the mid-section of the barrel is intended to decrease the trampoline effect in that specific region.

The trampoline effect refers to the increased elasticity that arises by replacing a single barrel wall of a given thickness with two or more walls of total thickness that may be equal to that of a single wall so as to permit greater deformation of the bat barrel when a ball was struck. While both barrel variants may have barrel walls of equal thickness, the substitution of multiple layers increases the elasticity of the bat barrel by reducing the radial stiffness of the barrel. This is because radial stiffness is proportional to the cube of the thickness of a layer of material. Stiffness is additive in the case of multiple-walls. The stiffness of the barrel wall of a double-walled bat is proportional to a factor based on the first thickness cubed plus a factor based on the second thickness cubed. This is a smaller number than the value of the two thicknesses together, cubed.

The result is that a bat wall that is divided into two or more layers is less stiff when struck by a ball. Reduced stiffness is equivalent to "more compliant". This improves the performance of

the bat in reversing the direction of the ball while preserving the same overall strength of the barrel wall against deformation. The invention of the present applicants intentionally degrades this elasticity in the barrel wall in a mid-section region by establishing a mid-section with a higher radial stiffness bounded by two lateral regions of lesser stiffness in order to achieve the benefit of an enlarged sweet spot. This is demonstrated by the graph of Figure 10. This is the unexpected result achieved by degrading the performance of the bat, in terms of its compliance, in the mid-section. This evidence was present in the specification as originally filed.

The opinion of the Examiner that Vacek increases or broadens the sweet spot beyond that of a normal bat of similar dimensions is erroneous. As has been discussed, there is no mention of "sweet spot" by Vacek, much less a broadening of the sweet spot. Increasing the trampoline effect, if this is achieved by Vacek, does not, of itself, broaden the sweet spot. If this were so, then broadened sweet spots would have been created years ago when the concept of increasing the trampoline effect was first appreciated. Instead the sweet spot is enlarged by creating a mid-section in the barrel that has higher radial stiffness than the radial stiffness on the two lateral sides. Vacek does not disclose or suggest this feature in any way. There is no basis for the Examiner to say that Vacek has achieved a broadening of the sweet spot.

Metallic character of Fritzke's bat

A significant distinguishing limitation in Claims 37, 38, 39 and 53 over Fritzke is that: "the barrel wall of the barrel portion consists essentially of polymer composite material". Fritzke does not contemplate using an all-polymer composite barrel within his bat. In fact, he is teaching away from that configuration.

The Examiner states that Fritzke: "in paragraph 8 at least contemplates the use of composite bat frames in regard to his invention". Presumably, this statement by the Examiner is to address the limitation in the claims of the present application that the subject bat barrels consist essentially of polymer composite material. In fact, in paragraph [0008] Fritzke states:

"[0008] While composite materials offer the advantage of a high strength to weight ratio, such materials also present design challenges. Composite inserts and bat frames are prone to wear and tear due to the inter-laminar shear which can occur between bonded layers of composite material. The deflection caused when a ball impacts the bat produces shearing stresses between the composite layers, sometimes causing the bond between adjacent layers to fracture or separate (especially over time)."

Thus Fritzke is teaching away from the use of polymer composite materials in a bat. In fact, the whole focus in the Fritzke disclosure is on building a bat with a metal frame and a metal insert. Further, the failures which Fritzke identifies as being associated with composite bats, as he understood them, relates to failures between layers within the polymer matrix. Such failures would not normally be remedied by increasing the thickness of a composite layer.

Fritzke provides, in paragraph [0057], as follows:

"[0057] Referring now to FIG. 2, the insert 18 comprises a metallic tubular sleeve 24 and a relatively thin composite layer 26 having its greatest strength in a substantially circumferential direction. The composite layer is bonded to the outer surface of the tubular sleeve 24.

Preferably, the tubular sleeve 24 is made of the same material as the tubular frame 11. However, it is not critical to use the same materials for both components. A popular material for the bat and the sleeve is high-grade aluminum such as C405 or C555. It should be understood that other materials will suffice. For instance, at a higher cost, titanium or metal matrix composites (such as aluminum matrix composites) can be used for the tubular frame 11 and tubular sleeve 24."

Thus Fritzke in paragraph [0057] refers to a composite layer 26 as lying over the surface of the tubular sleeve 24 that is made of metal, e.g. aluminum, titanium or metal matrix composites. Accordingly, the insert or sleeve 24 in Fritzke does not consist essentially of a polymer composite material. And neither does the barrel wall of Fritzke consist essentially of a polymer composite material.

To emphasize this point, Fritzke further states at his paragraph [0052]:

"[0052] ... A popular material for the bat and the sleeve is high-grade aluminum such as C405 or C555. It should be understood that other materials will suffice. For instance, at a higher cost, titanium or metal matrix composites (such as aluminum matrix composites) can be used for the tubular frame 11 and tubular sleeve 24."

An aluminum matrix composite is not the same as a polymer composite. According to Wikipedia:

"MMCs [metal matrix composites] are made by dispersing a reinforcing material into a metal matrix. The reinforcement surface can be coated to prevent a chemical reaction with the matrix. For example, carbon fibers are commonly used in aluminum matrix to synthesize composites containing low density and high strength. However, carbon reacts with aluminum to generate a brittle and water-soluble compound on the surface of the fiber. To prevent this reaction, the carbon fibers are coated with nickel or titanium boride.

"The matrix is the monolithic material into which the reinforcement is embedded, and is completely continuous. This means that there is a path through the matrix to any point in the material, unlike two materials sandwiched together. In structural applications, the matrix is usually a lighter metal such as aluminum, magnesium or, and provides a compliant support for the reinforcement. In high temperature applications, cobalt and cobalt-nickel alloy matrices are common."

This is to be contrasted with a polymer composite which is defined in paragraph [0052] of the present application as follows:

"[0052] A polymer composite is a non-homogenous material consisting of continuous fibers embedded in, and wetted by, a polymeric resin matrix whereby the properties of the material are superior to those of its constituent fibers and resin taken separately."

Fritzke provides, in paragraph [0069], as follows:

"[0069] The present invention, with its insert-supported barrel and composite-reinforced insert provides several advantages. A conventional multi-wall bat having an aluminum insert exhibits excellent impact response but, due to its relatively thin outer wall, may be prone to denting and

have a relatively short useful life. A conventional multi-layer composite insert supported within an aluminum tubular bat helps prevent permanent deformation and optimizes durability but may reduce desirable elastic deflection in the bat due to the high modulus of elasticity of the composite material. The present invention, however, overcomes these shortcomings by combining the elasticity and isotropic shear strength of the tubular sleeve (at the center of this load bearing member) with the circumferential strength of a thin composite material (at the outer surface of the load bearing member) to produce a bat with improved durability and little or no reduction in performance."

This paragraph clearly demonstrates that Fritzke is focused on providing a bat with a metallic frame and insert. The presence of an isotropic metal in the tubular sleeve is a key objective in this disclosure.

The phrase "isotropic shear strength of the tubular sleeve" is a characteristic of a metal and not of a polymer composite material. Thus Fritzke contemplates the use of a metallic insert covered with a polymer composite layer. By way of contrast, paragraph [0052] of the present application describes polymer composites as being anisotropic. Thus Fritzke teaches away from the concept of the present invention as addressed in Claims 37, 38, 39 and 53 which contain the limitation that the barrels of such bats consist essentially of polymer composite material.

General Principles for Assessing for Obviousness

The Examiner is well acquainted with the principles respecting the application of 35 USC 103 to patent applications. Nevertheless, based on recent developments in this aspect of the law, the applicants respectfully request the opportunity to review those developments and revisit certain points of basic principle.

On October 10, 2007 the USPTO published in the Federal Register examination guidelines on the issues of obviousness arising from the Supreme Court decision in KSR vs Teleflex. The following discussion is based on a review of those guidelines.

To reject a claim based on obviousness an examiner must explain why the difference(s) between the prior art and the claimed invention would have been obvious. But this judgment should not be made on the basis of already acknowledging the existence of the applicants' invention. Rather, in this case it should be made on the basis of what a person having ordinary skill in the art would have been able to foresee at least as of the applicants' filing date of September 29, 2003 without previously having the advantage of knowing about the applicant's invention and its beneficial features.

The Examiner may consider relying upon some or all of the following rationales in order to support an obviousness rejection:

- the prior art elements are combined according to known methods to yield predictable results;
- one known element is substituted for another to obtain predictable results;
- known techniques are used to improve similar devices, methods, or products in the same way;

- a known technique is applied to a known device, method, or product ready for improvement to yield predictable results;
- the claimed invention was "obvious to try," as by choosing from a finite number of identified, predictable solutions with a reasonable expectation of success;
- known work in one field prompted variations of it in the same or different field based on design incentives or other market forces and the variations would have been predictable to one of ordinary skill in the art; or
- some teaching, suggestion, or motivation in the prior art would have led one of ordinary skill in the art to modify a prior art reference or combine prior art reference teachings.

The applicant has underlined key words or phrases in the above passages. All of these words or phrases, "predictable", "in the same way", "would have led", etc., require that there would have been, as of the critical date, September 29, 2003, a ready awareness by a person of ordinary skill in the art of the prospective invention and its advantages. Such a person would be expected to possess only an understanding of the prior art and ordinary creativity. Such a person should not be expected to possess an understanding of the advantages of the invention because one cannot perceive the advantages of an invention that has not yet been perceived.

The guidelines amplify each of the above points with examples and repeat the requirement for predictability in each case. Using the first point only as an example:

"Office personnel must ..articulate...:

3) a finding that one of ordinary skill in the art would have recognized that the results of a combination were predictable;"

This is an invention where the advantages were not known to persons of ordinary skill in the art at least as early as the date of filing of the application by the inventors. That date is September 29, 2003. Vacek filed an application for an all-polymer bat as early as Jan. 19, 2001. There is no suggestion in Vacek of the advantages of providing a localized region of increased radial stiffness in the mid-section of a bat barrel, bounded by two lateral regions of lesser radial stiffness. Meanwhile, it was not until Fritzke filed his continuation application of January 21, 2004, based on his original filing of September 15, 1999, that we see a first recognition of the advantages of producing an enlarged sweetspot.

It may be thought that determining whether an invention would have been obvious to a person having ordinary skill in the art requires envisaging such a person confronted with both the prior art and the claimed invention as of the invention date. The problem with this scenario is that it presupposes that the person of ordinary skill in the art has been presented with the invention and asked to make a comparison and evaluate the differences between the invention and the prior art.

Such a mode of analysis is not appropriate in the case of an idea which is simple to implement but no one has ever addressed such a possibility. Part of the invention may reside in recognizing a possibility where others failed to see it. An advance which arises out of recognizing unforeseen advantages should qualify as being inventive because the person skilled in the art is postulated as not previously having been aware of the possibilities as represented by the invention.

Hence, rather than envisaging such a person confronted with both the prior art and the claimed invention at the relevant date, such a person should be envisaged as only being aware of

the prior art. Then the question should be asked: "Would the invention be obvious under those circumstances?" The legitimacy of this scenario is that the person skilled in the art is not given a prior hint as to the invention they are expected to perceive, in determining whether the invention is "obvious".

In this latter scenario, our hypothetical person may be presumed to know not only what is known in terms of the prior art, but also what is acknowledged in the prior art as unsolved problems. But if there is no recognition or general awareness of an unsolved problem, such a person should not be presumed to recognize prospective advantages that will only seem to be readily apparent once the invention is known.

The danger of hindsight analysis has been reviewed in many judgments and by many commentators. The essence of hindsight analysis is that you presume knowledge of the existence of the invention when you undertake the test for obviousness based upon a comparison of differences. The better procedure is to hypothesize the situation of a person skilled in the art having no knowledge of the invention.

Assuming this person has no knowledge of the invention, asking whether an invention would be obvious to such a person is really to ask whether they would be naturally or readily aware of the idea of the invention and its advantages without having to possess anything more than ordinary creativity and ordinary skill in the art and access to the known prior art.

Non-Relevance of Fritzke to obviousness of present invention

The applicants acknowledge that the Fritzke reference might otherwise be relevant prior art for the purposes of 35 USC 102 - anticipation. However, a rejection based on 35 USC 103 is not appropriate because the claims include the limitation that the barrel of the bat consists essentially of polymer composite material and the barrel mid-section in the case of the thickening of Claim 53 is formed of the same general material as the underlying barrel wall portion with which it is associated. Fritzke does not have these features. Accordingly, such claims do not read-on the bat as described in Figures 14 and 15 of the prior Fritzke published application.

The applicants take the position that the Fritzke reference is not prior art for the purposes of a 35 USC 103 - obviousness - rejection.

The applicants rely upon the following summary of the law taken from the recent CFAC decision of November 16, 2007 in:

Z4 TECHNOLOGIES, INC. v. MICROSOFT CORPORATION and AUTODESK, INC.:

"[A]n accidental and unappreciated duplication of an invention does not defeat the patent right of one who, though later in time, was the first to recognize that which constitutes the inventive subject matter." *Silvestri v. Grant*, 496 F.2d 593, 597 (CCPA 1974). Thus, "[t]he date of conception of a prior inventor's invention is the date the inventor first appreciated the fact of what he made." *Dow Chem. Co. v. Astro-Valcour, Inc.*, 267 F.3d 1334, 1341 (Fed. Cir. 2001). In other words, conception requires that the inventor appreciate that which he has invented."

<http://www.cafc.uscourts.gov/opinions/06-1638.pdf>

If the applicant's present application were put into Interference with the cited reference by Fritzke, there would be no evidence on the face of the Fritzke document that Fritzke "appreciated the fact of what he made", if in fact he did make or describe a bat that had an enlarged or broadened sweetspot. The Fritzke published application by itself does not establish the fact that a bat of the design as depicted would have an enlarged sweetspot. But assuming as a hypothetical that a bat built according to this prescription of Figures 14 and 15 of the published Fritzke application would manifest an enlarged sweetspot, nevertheless there is no indication whatsoever in that publication of a recognition that the inventor appreciated the fact of what he had made in this respect.

The applicants acknowledge that the Fritzke reference might otherwise be prior art for the purposes of 35 USC 102 - anticipation, but does not so qualify because the claims as pending do not read-on the bat as described in Figures 14 and 15 of the prior Fritzke published application. However, the applicants assert that the Fritzke reference is not prior art for the purposes of 35 USC 103 - obviousness - rejection. It is not prior art on this basis by reason of the fact that there is no indication in this reference that the inventor had any appreciation as to how his bat design might affect the character of the sweetspot in his bats.

Alternately, Fritzke's failure to provide any indication of a recognition that his bat may have had an enlarged sweetspot it is a fundamental consideration in respect of assessing whether or not the applicants present invention, as claimed, is a patentably non-obvious advance over Fritzke's activities.

An Obvious Rejection based upon Vacek and Fritzke

The applicants submit that:

- 1) the elements in the applicants' bat design do not merely perform the function that each element performs separately; and
- 2) the results of the claimed combination were unexpected.

The applicants' reasons for these submissions are as follows.

In respect of point 1), the essence of the combination is the placement of the region of increased radial stiffness. Increased radial stiffness must be present in the mid-section of the barrel rather than in the lateral two sides. As we recall, Vacek lacks such a feature. It is the combination of the placement of the region of increased radial stiffness in the mid-section of a polymer-composite bat that produces a new result.

In regard to Fritzke, the applicants are not, according to the claims as now pending, addressing the combination of a metal bat with the addition of one or two thin polymer composite reinforcement layers to provide increased strength. Bats as presently claimed by the applicants are based on a different structure from that of Fritzke. Fritzke disclaimed the desirability of producing bats out of polymer composite material.

In respect of point 2), the results of the applicant's invention are clearly unexpected. Neither Vacek nor Fritzke were aware of the possibility and benefits of providing a bat with a broaden sweet spot.

Fritzke was working with metal bats. The applicants have filed evidence (c.f. Figure 10 of their application) of the change in performance of a bat with a polymer composite barrel which has a mid-section portion of increased thickness. The applicants have now presented claims directed to bats with barrels which consist essentially of polymer composite material. It would be speculation for the Examiner to say that the modified all-metal bats of Fritzke would perform equivalently to the applicants' polymer-based bats.

Accordingly it would be conjecture founded on conjecture to say that the Fritzke disclosure provides a basis for concluding that a person of ordinary skill, considering a bat of the Fritzke design, would obviously recognize the prospective advantages of building an all-polymer bat with a barrel mid-section of increased radial thickness so as to provide such a bat with a broaden sweet spot. This is the reverse situation from: "obvious to try". There would be no motivation for the ordinarily skilled person to try the modification of Fritzke in an all-polymer bat.

It must never be forgotten that Fritzke was endeavouring to strengthen a metal bat from being damaged without unduly increasing the weight of the bat. Fritzke's efforts are focused on being minimalistic. Fritzke's efforts do not suggest experiments to provide a broaden sweet spot; once the Fritzke metal bat has been adequately strengthened, his efforts are over.

As "secondary considerations" the applicants point to the failure of others to implement the invention prior to the applicants' filing date. Of particular note is the further application by Fritzke on January 21, 2004, after the present applicants' filing date of September 29, 2003, leading to US Patent 6,949,038. This is the first indication in a patent application originating from the inventor Fritzke that he perceived the possibility of broadening the sweet spot within a baseball bat. The absence of an earlier initiative by Fritzke is a legitimate "secondary consideration".

Not obvious to combine features of Fritzke and Vacek

The applicant submits that it would not be obvious to combine the features of Fritzke and Vacek to produce the subject matter addressed in Claims 37, 38, 39 and 53. All of these claims stipulate for a barrel wall portion which consists essentially of "polymer composite material" wherein the barrel wall has a "radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel portion" with the added limitation that such bat is additionally provided with:

"a relatively flattened batting performance level along such mid-section compared to the batting performance level along the immediately adjacent portions of the lateral regions on the respective sides of the mid-section and thereby with an enlarged sweet spot."

Neither Fritzke nor Vacek were aware of the possibility of addressing the broadening of the sweet spot of a baseball bat barrel. There is no suggestion or motivation presented by the Examiner which would cause a person ordinarily skilled in the art to choose to combine the Vacek and Fritzke references. Neither of these references recognizes the benefits of providing a barrel mid-section with increased radial stiffness and consequently an enlarged sweet spot in the context of an all-polymer barrel.

Fritzke is concentrating on providing strengthened barrel parts that are of hybrid material e.g. a metal frame and an insert having polymer composite layers, so as to combine the best features of each of these two materials. Fritzke is endeavouring to do this in order to achieve both durability and performance while minimizing the weight of the bat. But Fritzke is focused on an exercise in minimalism and is not aware of the issue of broadening the sweet spot.

Vacek is concentrating on providing a bat of improved performance based upon the use of polymer composite material without reference to any localized strengthening or stiffening of the bat along the striking portion of the barrel. Vacek is talking about changing fiber angles and other parameters from bat to bat to get different properties from bat-to-bat. Vacek is also focused on achieving improved performance while avoiding the addition of further unnecessary weight to the bat. But Vacek is not addressing the issue of changing fiber angles and other parameters within a given bat, or along the length of the barrel of a given bat. Thus these two inventors are pursuing different objectives both from each other and from the objectives of the present inventors. This makes it unobvious to combine their teachings.

Accordingly, the applicant submits that a rejection of Claims 37, 38, 39, and 53 on the basis of obviousness would not be appropriate

Patentability of Specific Claims

Claims 38, 53, 60/53, 61/53, 67/38, 67/53, 68/38, 68/53 under 35 USC 102

The Examiner's specific objections to the previous claims will now be addressed.

Claim 38

In regards to Claim 38, Vacek does not disclose the structure by which the present invention provides a bat with a: "... barrel wall with a radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions" and "...a mid-section in the barrel that has higher radial stiffness than the radial stiffness on the two lateral sides" as stipulated in all of the independent claims under examination and particularly Claim 38.

Nor is there found in Vacek any: "... lateral regions extending on each side of the mid-section towards the distal and proximal ends respectively, ...the radial stiffness of the barrel wall being greater in the mid-section of the barrel portion than in the two lateral regions of the barrel portion..." as also stipulated in all of the independent claims under examination and particularly Claim 38.

Lastly, Vacek does not provide a bat having a barrel: "with an increased or broadened sweet spot." Accordingly, there is no basis for rejecting Claim 38 as anticipated by Vacek. And there is no basis in Vacek for asserting a 35 USC 103 rejection against claim 38 or any of the other independent claims under examination.

Reconsideration is accordingly requested.

Claim 53

In particular there is even less basis for rejecting Claim 53 as anticipated by Vacek. For reasons that have been previously stated, there is no suggestion in Vacek of providing a mid-section portion of a barrel that has a thickness that is greater than the thickness of the two lateral portions so as to provide an enlarged sweet spot. It is not understood how the Examiner can apply Vacek as a 35 USC 102(e) reference against claim 53, or even as a 35 USC 103 reference.

Reconsideration is accordingly requested.

Claim 60/53

In regards to Claim 60, Vacek does not disclose the structure by which the present invention provides a bat: "... wherein the increased thickness of the barrel wall in the barrel mid-section is the only part of the barrel portion that is of increased thickness over the thickness of the barrel wall in the lateral regions" as stipulated in Claim 60. Thus, apart from its dependency on Claim 53, Claim 60 provides a patentable distinction over Vacek.

Furthermore, Vacek lacks, as stipulated in Claim 53 any: "... two lateral regions commencing immediately adjacent to and extending respectively on each either side of the mid-section towards the distal and proximal ends respectively, ...the radial stiffness of the barrel wall being greater in the mid-section of the barrel portion than in the two lateral regions of the barrel portion..."

According this claim should be patentable over Vacek. Reconsideration is accordingly requested.

Claim 61/53

In regards to Claim 61, Vacek does not disclose the structure by which the present invention provides a bat: "... wherein the barrel mid-section of increased thickness is centered around the middle of the barrel " as stipulated in Claim 61. Thus, apart from its dependency on claim 53, Claim 61 provides a patentable distinction over Vacek.

Furthermore, Vacek lacks, as stipulated in Claim 53 any: "... two lateral regions extending respectively on each side of the mid-section towards the distal and proximal ends respectively, ...the radial stiffness of the barrel wall being greater in the mid-section of the barrel portion than in the two lateral regions of the barrel portion..."

Accordingly, this claim should be patentable over Vacek. Reconsideration is accordingly requested.

Claims 67/38, 67/53

Claims 37, 38, 39 and 53 all refer to bats which may either be single walled or multi-walled. Claim 67 refers to the special case where a bat is single walled. Claim 68 refers to the case where a bat is multi-walled. More specifically Claims 67/38, 67/53 stipulate for the case wherein: "the bat

is a single wall bat". The Examiner comments in his Office Action (page 7) in respect of these two claims that the "insert 112 (in Vacek) is considered to be inserted into a single wall bat."

By these very words the Examiner is describing a multi-wall bat. When the insert 112 is inserted into a bat frame, a multi-wall bat necessarily is produced. It is not understood how this statement by the Examiner can be used as a basis for rejecting Claims 67/38, 67/53 which applied to the case wherein: "the bat is a single wall bat". These two claims exclude the case wherein an insert has been slid into another frame.

Reconsideration is accordingly requested.

Claims 68/38, 68/53

In respect of Claims 68/38, 68/53, the Examiner states that "the innermost layer of insert 112 is considered to be inserted into a multi-wall bat form by the outer layers of insert 112 and a bat into which it is inserted." However, the Examiner seems to be confusing layers with walls. The wording in claim 68 referring to "a multi-wall bat, which includes a double wall bat" references distinct walls and not layers.

It is not understood how this statement can lead to a rejection of Claims 68/38, 68/53. In all events, Claims 68/38, 68/53 are distinguished over a Vacek by reason of the limitations of Claims 38 and 53, further stipulating for the case of a multi-wall bat.

Reconsideration is accordingly requested.

Claims 37 and 39 under 35 USC 103

The Examiner has rejected Claims 37 and 39 as being the obvious under 35 USC 103 (a), relying on the combination of Vacek and Fritzke. The scheme of Claims 37, 38 and 39, as previously indicated above, is as follows

"37 ...reinforcing fibers at various angles with respect to the longitudinal axis, the reinforcing fibers present within the barrel wall of the mid-section being at a higher average angle with respect to the longitudinal axis than the average angle of the fibers within the barrel wall of the two lateral regions of the barrel portion."

"38. ...the barrel wall in the mid-section contains a higher percentage of fibers than in the lateral regions."

"39. ...the reinforcing fibers within the barrel wall of the mid-section contain a higher percentage of fibers of higher stiffness than in the lateral regions."

The Examiner proceeds to apply 35 USC 103 (a) on the basis that, even in the cases where a different fiber type (Claim 39) or different fiber angle (Claim 37) is used in the insert of Vacek to increase the stiffness in the center of the bat barrel, such alternate techniques for providing increased radial stiffness are obvious.

With respect to this 35 USC 103 (a) obviousness rejection of Claims 37 and 39 the applicant relies on all of its submissions made above respecting Claim 38; namely, that Vacek does not

provide a bat with a barrel mid-portion that is stiffer than portions of the barrel at either side (meaning at both ends) of the insert.

Further, in respect of Claim 54 whose limitations are now merged into claim 53, there is absolutely no rationale why Vacek would thicken the mid-section of his bat over the thickness of the two lateral regions bounding the mid-section by the specified amount in order to achieve an enlarged sweet spot since Vacek was not addressing the objective of providing an sweet spot along the length of his barrel.

Reconsideration is accordingly requested.

Claims 42(37, 38, 39); 43/42(37, 38, 39); 44/42(37, 38, 39); 45/42(37, 38, 39); 63/(53, 54); 64/63/(53, 54); 65/63/(53, 54); 66/63/(53, 54); 72/60/(53, 54) under 35 USC 103

The Examiner has rejected the above claims as being obvious under 35 USC 103 based on Vacek in view of Fritzke. The scheme of these claims is now as follows:

Claim 41, 63 - mid-section is less than 50% of the length of the barrel portion

Claims 42, 64 - mid-section is between 33.3% to 12 1/2% of the length of the barrel portion.

Claims 43, 65 - mid-section is between 25 % to 12 1/2% of the length of the barrel portion.

Claims 44, 66 - mid-section is between 16 2/3% to 12 1/2% of the length of the barrel portion.

Claims 45, 72 - (amended to provide other limitations)

It is inventive for the present applicants to have stipulated for preferred relative dimensions of the stiffened mid-section portion of the barrel as provided in Claims 41-44 and 63-66. By stipulating for a maximum length for the mid-section, these claims correspondingly stipulate for the degree of presence of lateral regions which have a lesser degree of radial stiffness. Such lateral regions serve to provide bat performance, allowing a bat to perform up to regulatory standards. The presence and dimensions of such lateral regions are important for achieving the effect of a enlarged sweet spot without undue loss of batting performance. Achieving an enlarged sweet spot is an unforeseen consequence.

The stiffening of the mid-section reduces bat performance while concurrently broadening the sweet spot. The presence of the lateral regions ensures that a degree of bat performance is still preserved. Accordingly, these claims contribute inventive character to the applicant's configurations.

Apart from all being dependent on Claims 37, 38, 39 and 53 from which these later claims draw patentability, these limitations on the length of the stiffened mid-section are not suggested in any manner in Vacek. Nor are they taught explicitly or implicitly in combination with the other limitations of these claims in Fritzke.

The Examiner states that, absent a showing of unexpected results, the exact length of the mid-section would obviously have been up to the ordinarily skilled artisan, depending on the particular bat characteristics desired by the batter in the bat. However, the premise of this assertion overlooks that it had never previously been appreciated that radial stiffness within a bat barrel could be engineered in a way which, while reducing bat performance to some degree, would have the effect of broadening the sweet spot, while permitting a degree of bat performance to be

preserved. The Examiner suggests that there is no evidence of unexpected results associated with this present application. The applicants have achieved the unexpected result as depicted in Figure 10.

Prior to the applicant's filing date of Sept. 29, 2003, there is no evidence in the literature of there being any knowledge of the unexpected result of broadening the sweet spot area in a baseball bat by increasing radial stiffness in an area generally confined to the sweet spot area as opposed to the two lateral regions on either side. Certainly no suggestion of this nature is made in the either of the Vacek or Fritzke references. Thus it is not reasonable to conclude that the location and other characteristics of the region stiffened would have been readily adopted by an ordinary skilled artisan. Accordingly, it would not have been obvious for a skilled artisan to adopt the variations stipulated in these claims.

Reconsideration is accordingly requested.

Claims 69/(53, 54)

The Examiner has rejected Claims 69/(53, 54) as being obvious based on Vacek in view of Fritzke. The gist of Claim 69 is that the barrel wall thickness on either side of the barrel mid-section that contains the sweet spot area is graduated towards a decreasing thickness within the lateral regions. Claim 69 is, ultimately, dependent on independent Claim 53 from which it draws patentability apart from the features that it adds.

The Examiner has simply stated that: "Fritzke teaches that composite inserts 44 and 46 may be used in conjunction in a graduated fashion to achieve the desired stiffness in the bat". In fact, Fritzke does not stipulate for composite inserts and items 44 and 46 are not inserts. Fritzke has stipulated (paragraph [0077]) that:

"... the first composite layer 44 is about 8.5 inches long and about 0.003 inch thick and is positioned on the tubular sleeve 24 such that the first end 48 is about 4.00 inches from the first end 20 of the insert 18. The second composite layer 46 is preferably about 4 inches long and about 0.0055 inch thick and is positioned on the top of the first composite layer 44".

The items 44 and 46 are layers formed over the body of the tubular sleeve 24 which then collectively constitute the insert. Tubular sleeve 24, as referenced further below, is metallic. It is tubular sleeve 24 that qualifies as an insert. Accordingly, it cannot be said of the barrel wall in Fritzke that it: "consists essentially of polymer composite material" as stipulated in all of the independent claims under examination, and particularly Claim 53 upon which Claim 69 depends.

The applicant submits on these immediate submissions and on the submissions made earlier above in respect of Claim 53 that there is no basis for the rejection of Claim 69 under 35 USC 103 based on the combination of Vacek and Fritzke.

Reconsideration is accordingly requested.

Claim 54

The Examiner proposed to reject Claim 54 under 35 USC 103 in view of Vacek. The limitation of claim 54 has now been merged into claim adding the feature that the thickness of the mid-section of the barrel is 5% greater than the thickness of the two lateral sides.

Fritzke has stipulated (paragraph [0077]) that:

" the first composite layer 44 is about 8.5 inches long and about 0.003 inch thick and is positioned on the tubular sleeve 24 such that the first end 48 is about 4.00 inches from the first end 20 of the insert 18. The second composite layer 46 is preferably about 4 inches long and about 0.0055 inch thick and is positioned on the top of the first composite layer 44".

However, there is no basis in the Fritzke reference to confirm the percentage difference in thickness in the thickened portions of Fritzke. The present application now stipulates in Claim 53 for a 5% minimum difference in thickness. This limitation further distinguishes over Fritzke.

This feature of extending the thickness differential beyond a certain threshold is not an obvious modification of Fritzke. Fritzke was motivated to strengthen his bat without increasing its weight. In several paragraphs of Fritzke, it is stated:

[0066] an increase in the overall size of the bat undesirably adds weight, often causing reduced bat speed and less slugging distance. (A hitter often can increase bat speed by using a lighter bat, thereby increasing the force transferred to the ball upon impact.)

[0066] The composite layer reinforces the sleeve 24, giving the insert greater hoop (circumferential) stiffness and strength in the impact portion (barrel) of the bat. The impact portion receives greater circumferential support, making it less prone to local plastic deformation (or "denting") and hence more durable. At the same time, the composite layer adds very little weight to the bat.

[0078] The thickness of the insert 18 therefore is greatest near the center where there are two concentric layers of composite material and decreases (incrementally) towards the first and second ends of the insert (which are not covered by any composite material). Such an embodiment is advantageous because it provides the greatest thickness and strength in the area where most impacts occur, and less thickness and less weight (and hence greater flexibility) in the area where the stress is less. This design therefore behaves much like a tapered beam. As a result, less material is needed for the tubular sleeve 24 and impact portion 12. Further, by using a shortened second composite layer 46, no more high cost composite material is used than is actually needed.

Therefore there is a teaching in Fritzke against proceeding in the direction of increasing the thickness differential. If the thickness differential is greater than 5%, the present invention teaches that the useful effect of an enlarged sweet spot can be achieved. Fritzke did not contemplate this. Fritzke did not recognize at the time of his subject application that the dimensions of the sweet spot would be affected by modifying the thickness of portions of the barrel. Fritzke had no motivation for a implementing a thickness differential that is greater than 5%, and particularly not in a bat with an all-polymer barrel.

Claim 55 and 37 CFR 1.132 declaration

The Examiner has not addressed the patentability of Claim 55, treating that claim as withdrawn, but the applicants now will.

The applicant has previously filed a 37 CFR 1.132 declaration of one of the inventors, Stephen Fitzpatrick, dated May 26, 2006. This declaration provides data comparing the change in radial stiffness along the length of a barrel made in accordance with the Fritzke disclosure and the assumptions provided by Fitzpatrick and a similar change for a bat in accordance with the design of the subject invention. His analysis describes a mathematical basis for arguing that a substantially smaller change in radial stiffness arises by providing a thickness increase of 0.005 to 0.040 inches for the mid-section over the lateral two sides in the bat of the Fritzke design compared to a similar thickness increase in a substantially all-polymer bat of the design of the present invention.

According to paragraph 11 of this declaration, the calculated increase in radial stiffness for the mid-section over that of the radial stiffness of the two lateral regions for a bat of the applicants' design is 94% as opposed to a 23% increase in radial stiffness attributable to the corresponding radial stiffness in a bat based on the assumptions associated with the Fritzke design. Such a difference necessarily leads to the formation of a broader sweet spot.

This information is based on the assumptions made in this declaration. The Examiner may contest those assumptions. But correspondingly, the Examiner has not been able to show the extent to which Fritzke's bat manifests an enlarged sweet spot, if any.

This declaration supplements the evidence present and in the original application based upon a comparison of Figures 9 and 10. Those figures amply demonstrate this surprising and unanticipated result that arises when the radial stiffness in the mid-section of a bat barrel of the tubular bat is increased over the radial stiffness on the latter two sides, particularly of the case of a bat with them all polymer composite barrel portion.

On this basis, it is submitted that it cannot be said that the prior disclosure in Fritzke in combination with Vacek renders Claim 55 obvious.

Reconsideration is accordingly requested.

Claim 56

The Examiner has not addressed the patentability of Claim 56, treating that claim as withdrawn. Claim 56 addressed the feature that the area of greater thickness in the barrel mid-section is integrally formed with the barrel wall portion whereby the thickened portion is formed of the same material as the underlying barrel wall portion.

Claim 56 was dependent on Claim 55 (mid-section is 0.005 to 0.040 inches thicker) and Claim 54 (formerly mid-section is 5% greater than the two lateral sides) and Claim 53 (the barrel wall thickness in the barrel mid-section that contains the sweet spot area is greater than the thickness of the barrel wall in the lateral regions and...the barrel wall of the barrel portion consists essentially of polymer composite material to provide the barrel wall with a radial stiffness in the

mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel portion and thereby with an enlarged sweet spot).

Claim 56 has been amended to substitute a different characteristic, but the following feature from claim 56 has been added to claim 53 feature:

- the area of greater thickness in the barrel mid-section is formed of the same general material as the underlying barrel wall portion with which it is associated,

There is no suggestion or teaching in Fritzke or Vacek to provide a baseball bat with this characteristic.

Fritzke did not contemplate a bat with an all-polymer barrel and Fritzke did not contemplate a bat wherein the barrel mid-section has a thickened mid-section which is " formed of the same general material" because Fritzke was addressing a procedure to reinforce an aluminum bat with a polymer composite material overlay. Fritzke's attention was directed away from this characteristic.

Vacek did not contemplate a bat with:

"- a mid-section within the barrel portion, the mid-section being of shorter length than the length of the barrel portion and including the sweet spot area; and

"- two lateral regions commencing immediately adjacent to and extending respectively on each side of the mid-section towards the distal and proximal ends respectively, ".

Accordingly, with these limitations present in Claim 53, and indeed Claims 37-39 and 53 are directed to a new configuration for a bat which is beyond the obvious vision of an ordinary workman skilled in the art.

Reconsideration is accordingly requested.

Claim 62

Claim 62 has been amended to provide that: " the lateral regions start from 1" to up to but not including [13] 2" from the center of the mid-section. This limitation specifically distinguishes over the mechanical structure in the Fritzke reference and, clearly, there is no basis in Fritzke for inferring that a bat with a stiffened mid-section that is between 2 to 4 inches in length would have any utility. Fritzke was focused on strengthening an aluminum bat along a general region intended to be struck by a baseball, a region which is larger than that associated with a normal sweet spot. It would not be logical for Fritzke to have increased the thickness of his barrel wall in a narrower zone, as stipulated in this Claim 62. Stiffening a bat in such a narrower zone has the advantage of leaving greater scope for the lateral regions to support a high batting performance. Thus Claim 62 should not only be secure against a 35 USC 102 rejection but also against a rejection for obviousness under 35 USC 103.

Other claims

The applicant believes that all of the claims and issues raised by the Examiner and the last office action have been addressed explicitly. If this is not true then the applicants submit that the balance of the claims pending are dependent from claims that this Response has already shown to be allowable. Apart from their additional limitations, such other claims should be allowable based on the fact that they depend from otherwise allowable claims.

New claims

New claim limitations have been introduced as follows:

Claims 45 and 54 - wherein radial stiffness of the barrel wall in the mid-section provides the bat with a relatively flattened batting performance level along such mid-section compared to the batting performance level along the immediately adjacent portions of the lateral regions on the respective sides of the mid-section.

Claims 56 and 75 - wherein the radial stiffness of the barrel wall in the mid-section provides the bat with a batting performance level that is reduced to substantially the batting performance level of the portions of the lateral regions immediately adjacent to each side of the mid-section.

Claim 72 - wherein the barrel wall thickness in the barrel mid-section that contains the sweet spot area is greater than the thickness of the barrel wall in the lateral regions by at least 8 1/3 % over the thinnest portion of the barrel wall in the lateral regions,

Claim 73 - wherein the thickness of the total barrel wall is greater in the barrel mid-section than in the two lateral regions by an amount selected from the group of ranges consisting of .010 inches to .040 inches in thickness; .015 inches to .040 inches in thickness, and 0.015 inches to 0.030 inches.

Claim 74 - wherein the bat is a double-wall bat having an exterior frame with a tubular barrel and an inner tubular insert within the barrel, the insert having a thickened portion extending internally within the insert along the mid-section of the barrel to provide the barrel wall with its barrel wall portion of greater thickness.

Claims 45 and 54 and Claims 56 and 75 progressively added further functional characterizations to the bats of the earlier claims from which these claims depend. The basis for these claims is described earlier, above, in respect of the introduction of such amendments.

Claims 72, 73 and 74 have also been addressed earlier, above, in respect of the introduction of the amendments.

All of these claims are patentable by reason of the earlier claims from which they depend and additionally, introduce further limitations which distinguish the scope of coverage from the prior art so as to establish their patentability.

Conclusion

On this basis, it is believed that a clear distinction has been shown between the cited references and the invention of the present application, as defined by the claims for which protection is presently being sought.

In view of the features and limitations of the claims as amended, it is submitted that the applicant is seeking coverage which is both novel and unobvious, providing an unexpected result over the cited references and over the prior art generally. Accordingly, reconsideration and a favourable ruling which will allow this application to advance to Allowance are therefore requested.

In the light of the amendments and submissions that are presently being made, if this application is not now allowable, the applicants respectfully request the opportunity to hold a personal interview with the Examiner at the patent office before the Examiner issues a further office action.

A number of claims are pending in this application on a "withdrawn basis" if the Examiner is prepared to issue an Allowance, the applicant requests an opportunity to review the withdrawn claims to determine whether any of those claims could be presented in a dependent form, referencing claims that are allowable.

Respectfully submitted,

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Per

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